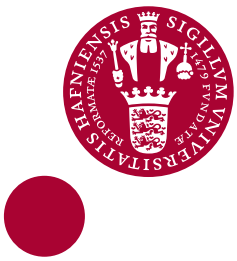

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Benchmarking farm animal welfare – Ethical considerations when developing a tool for cross-country comparison[1]

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Abstract

A tool enabling animal welfare to be benchmarked across countries would make it possible to monitor and compare the status of animal welfare at both disaggregated and aggregated levels. The results of the international benchmarking would be useful for a wide range of stakeholders taking a positive interest in farm animal welfare.

We aim to build a model for pigs and chickens with the following elements: 1) For each type of animal production considered a number of parameters linked to housing and management are defined. The parameters relate to features of production that are modified in legislative and market-driven initiatives to improve welfare. 2) By means of assessments made either by consumers or by experts, each value of these parameters is assigned a weight. 3) In each country the welfare level (beyond the basic level defined by EU regulation) found in the production, or the consumption, of pork and chicken meat is calculated. 4) The total state of farm animal welfare across different forms of production (here only two forms) is calculated for each country.

A number of ethical considerations must be addressed in the process of building the model. In the paper, we explain how we deal with the following considerations: The *first* concerns how to measure what affects animal welfare – whether the focus should be on environmental or outcome-based measures. *Secondly*, weights will need to be assigned to the different parameters, raising the question whether this should be done by animal welfare experts or consumers. *Thirdly*, it will be necessary to decide what to include for each country, and specifically whether it should be the welfare of animals produced in a country, including exports, or the amount of animal products consumed in the country, including imports. *Fourthly*, a decision will need to be taken on how to add welfare across pigs and chickens, and whether to count number of individuals, the volume of products or the value of products.

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Introduction

The idea of farm animal welfare first surfaced in Western Europe in the 1960s. Initially, it was anticipated that the main driver of improvements would be national animal welfare legislation. Increasingly, however, the focus shifted to common cross-national legal requirements defined by the EU. A number of EU directives were agreed which defined minimum standards for national farm animal welfare legislation. Some countries have implemented legislation going beyond what is required by the EU, whereas others have sought merely to ensure the bare minimum. These efforts to improve farm animal welfare by means of regulation at EU level came to a standstill at the beginning of the new millennium. Instead, over the past two decades there has been a growing focus on so-called market-driven animal welfare, where animal products guaranteeing what is perceived to be better animal welfare are sold with a special label, typically at a higher price, part of which is used to pay the farmer a premium.

What has emerged is a pluralist European approach which has certain advantages (Lundmark et al 2014). To begin with, it enables countries that are ambitious about animal welfare to be the first movers in terms of legislation. Additionally, it is possible for farmers, processors, retailers and groups of consumers, sometimes supported by state-driven labelling initiatives, to collaborate in setting standards that secure a level of animal welfare that is difficult to achieve by means of legislation.

The only problem here is that it seems to be difficult to track how much is actually being achieved on the ground in terms of improved animal welfare, particularly when it comes to cross-country comparisons (Lundmark et al 2014). How, for example, is a country like Sweden, with relatively high legal standards of animal production but a very small market share for market-driven animal welfare, doing, as compared with the UK, with a lower legal standard for animal production, but a larger market share for animal products with special welfare labels?

To deal with this problem, the authors of this paper have been working with a project which aims to develop a tool for benchmarking animal welfare initiatives across countries to document best practice and inspire new developments.

In the project, we focus on pork and chicken meat. We plan to apply the benchmark to six European countries: the UK, Germany, Sweden, the Netherlands, Spain and Denmark. For each country, we will focus on two main parameters: 1) Legal requirements (including compliance); 2) initiatives to improve animal welfare through special, labelled products (adjusted to the market share and the quality of the control and certification schemes).

In carrying out the project, we need to develop a model that will make it possible to quantify each parameter and, for each country, add up the parameters to an overall benchmark value for farm animal welfare both for each of the two types of animal product and across the two products. To do this, a number of choices have to be made – e.g. concerning the weight to be assigned to each parameter, and whether to measure local production or local consumption. Underlying these choices will be ethical considerations, and the aim of the present paper is to set out these considerations and explain how we intend to deal with them in the project.

Our inspiration

We have taken as our inspiration a model used to rank and compare the international competitiveness of more than 70 countries annually by the IMD World Competitiveness Center (IMD 2018). More than 340 criteria are included. The results are presented in the World Economic Forum's Global Competitiveness Report (World Economic Forum (2018)).

The measurement of international competitiveness and the international benchmarking of animal welfare belong to two different disciplines: economics and animal welfare science. The principles behind the methods used to aggregate inputs in the two different cases can, however, be compared and used since, in both cases, a number of very different criteria (factors) are included. Thus data can be in the form of percentages, indices, rankings, value, number, etc. In both cases, the goal is also to arrive at weighted and comparable indices and rankings across countries.

We aim to build a model for pigs and chickens with the following elements: 1) For each type of animal production considered a number of parameters linked to housing and management are defined. The parameters relate to features of production that are modified in legislative and market-driven initiatives to improve welfare. 2) By means of assessments made either by consumers or by experts, each value of these parameters is assigned a weight. 3) In each country the welfare level (beyond the basic level defined by EU regulation) found in the production, or the consumption, of pork and chicken meat is calculated. 4) The total state of farm animal welfare across different forms of production (here only two forms) is calculated for each country.

We will now outline the key challenges that have to be considered when building a model along these lines to add up animal welfare. Each challenge gives rise to ethical considerations; and these ethical considerations are the main focus of this paper.

Challenges and the ethical considerations to which they give rise

The *first* challenge is to map the parameters which affect animal welfare. Here, we need to consider how many aspects to include and whether to focus on environmental or outcome-based measures. *Secondly*, weights have to be assigned to the different parameters. Here priorities will typically be elicited from test persons, but the question is: Who should these test persons should be, animal welfare experts or normal consumers? *Thirdly,* it is necessary to decide what to include for each country. Here the question is whether to look at the production taking place within the country, including exports, or the amount of animal products consumed within the country, including imports. *Fourthly,* a decision needs to be taken on how to aggregate welfare across pigs and chicken. Should we count the number of individuals, the volume of products, or the value of products? We will look at these issues in more detail in turn.

What to include – environmental or outcome-based parameters?
The term "animal welfare" denotes a concept that has undergone developments in its more than 50-year history and is, in a number of ways, contested. However, at least among those engaged in animal welfare science, there seems to be a rather wide agreement that animal welfare is about how animals feel about, or react to, the conditions in which they live and the care they are given.

On this view, the most valid way to measure animal welfare is by means of so-called outcome-based measures (shoulder wounds, fear reactions, disease load, numbers of dead animals, etc.; EFSA 2012). However, most animal welfare legislation and most market-driven

initiatives focus on parameters describing what is given to the animals, i.e. on so-called environmental factors (space, outdoor access, quality of bedding etc.; EFSA 2015).

Environmental factors may be relatively easy to collect and process, but are best seen as risk factors Some environmental measures have a more or less direct effect on outcome-based measures: outdoor access may, for example, limit the incidence of respiratory diseases (Lorenz et al 2011). But in other cases there may be less clear, or even aversive, effects. Mortality is, for example, higher in free range than it is in battery hens (Lay et al 2011).

The question of what to include also concerns the number of criteria and degree of detailing. Assessments of international competitiveness calculations involving several hundred criteria show that relatively few criteria are dominant. The inclusion of additional criteria does not, therefore, improve the model significantly. The same may be the case for animal welfare.

In our project we decided to focus mainly on environmental measures. This decision is primarily supported by the argument that it is practically feasible to register the levels of animal welfare defined by such measures, since they figure both in legislation and in most schemes for market-driven animal welfare. Furthermore, issues about outcome will be adjusted in light of weights assigned to each measure.

Weights – should they be decided by experts or consumers/citizens?
Before weights can be assigned, it will be necessary to have a list of parameters that play an important part in the welfare of the animals in question.

In the case of slaughter pigs, a simplified table with parameters could look something like Table 1. The first column gives the name of the of the parameters. The second indicates the legally minimum resources according to current EU requirements, and welfare improves as we move to the right. To assess how much welfare has increased, weights have to be assigned.

Table 1 – Examples of parameters affecting the welfare of slaughter pigs

PARAMETERs	Animal welfare level 1	Animal welfare level 2	Animal welfare level 3	Animal welfare level 4
Indoor space provision	Min. 0.65 m^2 per animal	Min. 0.85 m^2 per animal	Min. 1.2 m^2 per animal	Min. 1.3 m^2 per animal
Rooting material	A chain or something similar	Car tyre or something similar on the floor	Soft wood or sawdust on floor	Straw or similar material on the floor
Outdoor access	No	Access to a veranda	Access to a field	Access to forest or some other planted area

To assign weights to the parameters it is necessary to consult with a group of people, either *experts in animal welfare* or *consumers.*

Experts in animal welfare science can give estimates of how the different levels of resource will impact on animals. The benefits of the individual animal welfare measures can, of course, be difficult to identify, and even more difficult to quantify and rank, but it is a reasonable

assumption that experts have some basis on which to assess animal welfare status in the individual cases.

Consumers can contribute with their preferences and priorities. Their attitudes can represent their wants and be indicative of market demand. This assumes that consumers have sufficient knowledge of the products available on the market. It also presupposes that consumer preferences include their real willingness to pay.

In our project, we will ask a panel of experts to assign the weights. The experts will be asked to give a value between 0 and 100 when answering questions such as "What is the welfare of a pig with access to a veranda (all other things being equal)?" – and the same for other values like those found in Table 1. We made this decision because to a large extent in our society it remains the role of animal welfare experts to give input on how best to improve animal welfare.

What to count in relation to each country – production or consumption?
The level of animal welfare in a country can be calculated either from its production, or from its consumption, of relevant animal products. The choice here might be very important, as some countries are net-importers of animal products, which implies that imported goods constitute a significant part of consumption, whereas other countries are net-exporters.

Let us consider a country that is a net-importer of animal products and that while this country upholds high standards of animal welfare in domestic production, it also imports cheaper products with lower animal welfare standards. This country will score high in the benchmarking if it is production-based, but it will have lower scores if the benchmark is consumption-based.

Roughly speaking, if the weights are made up of consumption market shares, we basically measure consumer preferences for animal welfare in the country, but if we focus on the share of production, we measure the ability or willingness of regulators, farmers, producers and the industry of the country to prioritize animal welfare. However, due to price competition in international markets, it may not be easy for the stakeholders just mentioned to prioritise animal welfare if consumers prefer to buy cheap imported food rather than welfare-friendly animal products with a price premium.

We have decided to include both consumption and production benchmarks. Differences between these two ways of benchmarking animal welfare may serve as the basis for interesting discussions about who should bear responsibility for farm animal welfare.

How to add up across species – counting heads, volume or value?
A final and important choice we need to make when setting up the benchmarks concerns how to add up scores when we are aggregating across species of farm animal. Should we count the number of individuals or the volume/value of products?

This choice will have a very large effect on the benchmark. In Denmark, for example, in rough numbers, around 100 million broilers, each living about 5 weeks, and 25 million pigs, each living for about 5 months, are produced per year; and each broiler weighs about 2 kg whereas each pig weighs about 100 kg when slaughtered. Hence, if the aggregation is carried out by means of number of individuals living at a given moment in time, Danish pig production will account for about 50% of the total welfare benchmark value for pigs and broilers (there are four times as many broilers than pigs produced per year, but each pig lives about four times longer before slaughter). If, on the other hand, the aggregation is done by weight the pig production will account for 93% of the benchmark value.

In support of the idea that we should look at numbers of animals we can point out that every animal is a sentient being, and that the experiences of sentient beings are what animal welfare is all about. In favour of using volume, or value, we can note that with more volume and value comes a bigger effect on the economy. In developing the model, we hope to find a way to make room for both perspectives.

Concluding remarks

Our aim is to establish a cross-national model to benchmark animal welfare status for two major types of farm animal in six countries. The model can subsequently be expanded to cover other farm animals (e.g. dairy cattle) and additional countries. At a higher level, data can be weighted and aggregated more, so that an index and a ranking for each type of farm animal (pigs and chickens) and for both in combination can be presented. When data have been gathered for several years, time series can also be presented.

We see this as a relevant contribution to discussions about how best to promote farm animal welfare at an international level. If successful, our model will produce results which can be used by the livestock and animal food products industry, as well as by NGOs, politicians and other stakeholders.

Our approach is, as far as we are aware, original. There have been other initiatives to map the animal welfare policies, focus and strategies of individual companies and retail industries, for example BBFAW (2019). The difference to our approach is that we aim to measure animal welfare in a way that allows for direct comparisons of welfare level, and that we also include the market shares of the products for both producers and consumers at country levels.

A limitation of our approach is, of course, that we to a large degree rely on expert scores on welfare effects of different initiatives and that a lot of the input is based on expert estimates, due to lack of objective, validated data in this field.

In this paper, we have focused on the ethical considerations that arise in the course of developing the model. However, to build and to sustain a reliable model a number of other challenges will also need to be considered:

- It will be necessary to establish a structured data collection system so that sufficient data for all countries will be included in the analysis. It is important up front to take into account all criteria that will influence the level of animal welfare in each country
- Access to reliable and comparable data in all countries will be needed. Data on market shares of production and consumption may be difficult to access, so interviews with stakeholders could become useful sources. A mutual network with key persons in participating countries would be beneficial if we are to create the most valid benchmarking model possible. Mutual benefits, consistency and updates may be important keywords for this network.
- Data must be processed so that the different data types (percentages, numbers, values, etc.) can be included. The data will come in different forms and will need to be converted into rankings and index values.
- It will be necessary to establish a valid weighting basis (possibly with several alternative weights) based on inputs from experts.
- Weighted international animal welfare indices at multiple levels and aggregation levels must be presented in a transparent way. The results must be presented in clear and readily understandable figures. However, documentation, transparency and sub-results are

important in the preparation and presentation of reliable figures that can be updated annually.

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